

Applicant : Jian Bai, Steven M. Fischer and J. Michael Flanagan  
Appl. No. : 10/806,907  
Examiner : Paul M. Gurzo  
Docket No. : 10980322-5 (12089.4004)

## IN THE CLAIMS

1-33. (Cancelled)

34. (Previously Submitted) An apparatus for ionizing analyte in a sample for delivery to a mass analysis device, comprising:

- (a) an ionization enclosure including a passageway configured for delivery of ions to the mass analysis device;
- (b) means to maintain said ionization enclosure at an ambient pressure of greater than 100 mTorr;
- (c) a means for containing the sample in said ionization enclosure at said ambient pressure;
- (d) a source of laser energy including means associated with said ionization enclosure for directing the laser energy onto said sample at said ambient pressure to desorb and ionize at least a portion of said analyte in the sample, and
- (e) means for directing the portion into said passageway.

35. (Previously Presented) The apparatus of claim 34 wherein the means for containing said sample is selected from the group consisting of a matrix located on a surface, one or more wells of a multi-well microtitre plate, a microchip array, a thin layer chromatographic plate, an electrophoresis gel, and a membrane, and combinations thereof.

36. (Previously Presented) The apparatus of claim 34 wherein the means for containing said sample is any conventional single or multi-chambered containment article.

37. (Previously Presented) The apparatus claim 34 wherein the means for containing said sample comprises a flowing or static liquid sample.

38. (Previously Presented) The apparatus of claim 34 wherein the mass analysis device is a mass spectrometer.

39. (Previously Presented) The apparatus of claim 34 wherein the laser energy is at ultraviolet (UV), visible (VIS) or infrared (IR) wavelengths, or combinations thereof.

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40. (Previously Presented) The apparatus of claim 34 wherein the ambient pressure is about atmospheric pressure.

41. (Previously Presented) An apparatus for mass analysis of at least one analyte in a sample, comprising:

- (a) an ion source having an ionization enclosure and a mass analysis device having a mass analysis enclosure, said ionization enclosure being connected with said mass analysis enclosure through a passageway configured for delivery of ions from the ion source to the mass analysis device, said ion source including:
  - (1) a holder configured for maintaining a matrix containing the sample in the ionization enclosure at ambient pressure;
  - (2) a source of laser energy directed onto the matrix maintained by said holder at ambient pressure to desorb and ionize at least a portion of said at least one analyte in the sample;
  - (3) means for directing the portion into said passageway; and
- (b) means to maintain said ionization enclosure at an ambient pressure greater than 100 m Torr while maintaining said mass analysis enclosure at a pressure less than about  $10^{-5}$  Torr.

42. (Previously Presented) The apparatus of claim 41 wherein the mass analysis device is time-of-flight, ion trap, quadrupole, Fourier transform ion cyclotron resonance, magnetic sector, or electric sector device, or combinations thereof.

43. (Previously Presented) The apparatus of claim 41 wherein the laser energy is at ultraviolet (UV), visible (VIS), or infrared (IR) wavelengths or combinations thereof.

44. (Previously Presented) The apparatus of claim 41 wherein the matrix is in a location selected from the group consisting of located on a surface, in one or more wells of a multi-well microtitre plate, in a microchip array, from a thin layer chromatographic plate, from an electrophoresis gel, from a membrane, and ~~or~~ from a static or flowing liquid, or combinations thereof.

45. (Previously Presented) The apparatus of claim 41 wherein the ionization enclosure contains a gas selected from the group consisting of air, helium, nitrogen, argon, oxygen, and carbon dioxide.

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46. (Cancelled) The apparatus of claim 41 wherein the source of laser energy is selected from the group consisting of an ultraviolet (UV), visible (VIS) or (IR) infrared laser.

47. (Previously Presented) The apparatus of claim 41 wherein the ambient pressure is atmospheric pressure.

48. (Previously Presented) The apparatus of claim 34 wherein the ambient pressure of the ionization enclosure is maintained between about +15% and -15% of atmospheric pressure.

49. (Previously Presented) The apparatus of claim 34 wherein the ionization enclosure is maintained at a temperature between about -20°C and +100°C.

50. (Previously Presented) Mass analysis apparatus including a matrix-assisted laser desorption and ionization (MALDI) source and a mass analysis device that receives and analyzes ions from the MALDI source, wherein the improvement comprises means for maintaining the MALDI source at an ambient pressure greater than 100 mTorr during the desorption and ionization.